

WHAT IS CLAIMED IS:

1. A method for reliably capturing print images, comprising:
 - (a) initiating camera operation within a scanner;
 - (b) scanning a biometric object to obtain a scanned image;
 - (c) processing the scanned image;
 - (d) determining print quality of individual print images in the scanned image;
 - (e) detecting prints in the scanned image; and
 - (f) determining whether the scanned image is ready for capture based on an expected number of prints detected in step (e) and the quality of the print images determined in step (d).
2. The method of claim 1, wherein the processing step (c) comprises:
 - (c1) filtering the scanned image;
 - (c2) binarizing the filtered image to obtain a binarized image;
 - (c3) detecting a print area based on the binarized image;
 - (c4) detecting print contrast based on the print area detected in step (c3) and the scanned image;
 - (c5) detecting a print shape based on the binarized image; and
 - (c6) separating the binarized image into individual print images based on the print area, contrast, and shape detected.
3. The method of claim 2, wherein the determining print quality step (d) comprises:
 - (d1) classifying each individual print image based on a predetermined quality threshold; and
 - (d2) indicating a quality classification of the individual print images based on the classifying step.

4. The method of claim 2, further comprising

- (g) capturing the scanned image to obtain a captured image;
- (h) processing the captured image;
- (i) forwarding the captured image to a computer; and
- (j) allowing an operator to annotate quality issues regarding the individual print images,

when the determining step (f) determines at least one of the following conditions:

that the expected number of prints is not present within the scanned image, and

that the expected prints are not all of good quality, and a predetermined quality time period has expired.

5. The method of claim 1, further comprising:

- (g) scanning the biometric object to obtain a subsequent scanned image;
- (h) processing the scanned image;
- (i) determining print quality of individual print images in the scanned image;
- (j) detecting prints in the scanned image; and
- (k) determining whether the scanned image is ready for capture based on an expected number of prints detected in step (j) and the quality of the prints determined in step (i),

when the detecting step (e) determines that no prints are detected, and a predetermined timeout period has not expired.

6. The method of claim 1, further comprising timing out the scanner when the detecting step (e) determines that no prints are detected, and a predetermined timeout period has expired.

7. The method of claim 1, further comprising:
- (g) scanning the biometric object to obtain a subsequent scanned image;
 - (h) processing the scanned image;
 - (i) determining print quality of individual print images in the scanned image;
 - (j) detecting prints in the scanned image; and
 - (k) determining whether the scanned image is ready for capture based on an expected number of prints detected in step (j) and the quality of the print images determined in step (i),
 - when determining step (f) determines at least one of the following conditions:
 - that the expected number of prints is not present within the scanned image, and
 - that the expected prints are not all of good quality, and a predetermined quality time period has not expired.

8. The method of claim 1, further comprising:
- (g) capturing the scanned image to obtain a captured image;
 - (h) processing the captured image; and
 - (i) forwarding the captured image to a computer,
 - when the determining step (f) determines at least one of the following conditions:
 - that the expected number of prints is not present within the scanned image, and
 - that the expected prints are not all of good quality, and a predetermined quality time period has expired.

9. The method of claim 8, further comprising:
 - (j) allowing an operator to annotate quality issues regarding the captured image.
10. The method of claim 8, wherein the processing the captured image step (h) comprises:
 - (h1) filtering the captured image;
 - (h2) binarizing the filtered image to obtain a binarized captured image;
 - (h3) detecting a print area based on the binarized captured image;
 - (h4) detecting print contrast based on the print area detected in step (h3) and the captured image;
 - (h5) detecting a print shape based on the binarized captured image; and
 - (h6) separating the binarized captured image into individual print images based on the print area, contrast, and shape detected.
11. The method of claim 10, further comprising:
 - (h7) determining print image quality of each individual print image based on minutiae data extracted from the individual print images.
12. The method of claim 1, wherein when the determining step (f) determines that a state exists where the expected number of prints is present within the scanned image and that the expected prints are all of good quality, further comprising determining whether the state changes during a predetermined capture delay time period.

13. The method of claim 12, further comprising:
 - (g) capturing the scanned image to obtain a captured image;
 - (h) processing the captured image; and
 - (i) forwarding the captured image to a computer,when the state does not change during a predetermined capture delay time period.
14. The method of claim 12, further comprising:
 - (g) scanning the biometric object to obtain a subsequent scanned image;
 - (h) processing the scanned image;
 - (i) determining print quality of individual print images in the scanned image;
 - (j) detecting prints in the scanned image; and
 - (k) determining whether the scanned image is ready for capture based on an expected number of prints detected in step (j) and the quality of the print images determined in step (i),when the state does change during a predetermined capture delay time period, and a predetermined quality time period has not expired.
15. The method of claim 12, further comprising:
 - (g) capturing the scanned image to obtain a captured image;
 - (h) processing the captured image; and
 - (i) forwarding the captured image to a computer,when the state does change during a predetermined capture delay time period, and a predetermined quality time period has expired.
16. The method of claim 15, further comprising:
 - (j) allowing an operator to annotate quality issues regarding the captured image.

17. A system for reliably capturing print images, comprising:
a scanner that scans print images, the scanner including a print capture manager, wherein the print capture manager determines that a scanned image is ready for capture when, within a predetermined capture delay time period, an expected number of prints is present within the scanned image and the expected prints are all of good quality;
a computer that stores and displays data regarding the captured print images and allows an operator to input annotation regarding the captured print images;
and
a communication link between the computer and the scanner that allows the transfer of data regarding the captured print images.

18. The system of claim 17, wherein the print capture manager determines that a scanned image is ready for capture when the expected number of prints is not present within the scanned image, or the expected prints are not all of good quality, and a predetermined quality time period has expired.

19. The system of claim 17, wherein the scanner comprises:
a sensor that detects print images via scanning;
an output device that displays to an operator information regarding the scanned images; and
a controller that controls interoperation of the sensor, the print capture manager, and the output device.

20. The system of claim 19, wherein the sensor comprises:
a platen that receives biometric objects; and
a camera that scans print images of the biometric objects.

21. The system of claim 19, wherein the output device comprises individual quality indicators for individual print images.

22. The system of claim 21, wherein the individual indicators are areas of a liquid crystal display (LCD) highlighted by symbols that represent a quality classification of each image.

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23. The system of claim 21, wherein the individual indicators are areas of a liquid crystal display (LCD) highlighted by shades or colors that represent a quality classification of each image.

24. The system of claim 17, wherein the computer comprises:
a memory that stores data regarding the captured print images; and
an operator interface that displays to an operator the captured print image data and allows an operator to input annotation regarding the captured print images.

25. The system of claim 24, wherein the operator interface comprises:
a monitor on which an operator can view the captured print image information; and
an input device from which an operator can input annotation.

26. A system for reliably capturing print images, comprising:
- means for initiating camera operation within a scanner;
 - means for scanning a biometric object to obtain a scanned image;
 - means for processing the scanned image;
 - means for determining print quality of individual print images in the scanned image;
 - means for detecting prints in the scanned image; and
 - means for determining whether the scanned image is ready for capture, wherein the scanned image is ready for capture when at least one of the following conditions is satisfied:
 - the expected number of prints is present within the scanned image and the expected prints are all of good quality, within a predetermined capture delay time period; and
 - the expected number of prints is not present within the scanned image, or the expected prints are not all of good quality, and a predetermined quality time period has expired.
27. The system of claim 26, further comprising:
- means for timing out the scanner when no prints are detected and a predetermined timeout period has expired.
28. The system of claim 26, further comprising:
- means for capturing the scanned image to obtain a captured image;
 - means for processing the captured image; and
 - means for forwarding the captured image to a computer, when it is determined that the scanned image is ready for capture.

29. The system of claim 28, further comprising:
means for allowing an operator to annotate quality issues regarding the captured image,

when some but not all expected prints are detected, or when all expected prints are present in the captured image and in good quality but do not remain present or in good quality for a predetermined capture delay time period, and a predetermined quality time period has expired.

30. A method for reliably capturing print images, comprising:
(a) initiating camera operation within a scanner;
(b) scanning a biometric object to obtain a scanned image;
(c) processing the scanned image;
(d) determining print quality of individual print images in the scanned image;
(e) detecting prints in the scanned image; and
(f) determining whether the scanned image is ready for capture based on an expected number of prints detected in step (e) and the quality of the print images determined in step (d), wherein the scanned image is ready for capture when the expected number of prints is present within the scanned image and the expected prints are all of good quality within a predetermined capture delay time period

31. The method of claim 30, further comprising:
(g) determining that the scanned image is ready for capture when the expected number of prints is not present within the scanned image, or the expected prints are not all of good quality, and a predetermined quality time period has expired.